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CITY OF GRIDLEY  
GENERAL PLAN  
CONSERVATION ELEMENT 5  
1983

Adopted June 18, 1984  
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CITY OF GRIDLEY  
GENERAL PLAN  
CONSERVATION ELEMENT

Table of Contents

	<u>Page</u>
<u>I. INTRODUCTION</u>	
A. Background and Purpose	1
B. Scope of Contents	1
C. Relationship to Other Elements	3
<u>II. ANALYSIS AND POLICY FOR NATURAL RESOURCES</u>	
A. Agricultural Soils	4
B. Water Resources	14
C. Vegetation and Wildlife	17
D. Air Quality	20
E. Sand and Gravel	24
F. Natural Gas	26
G. Energy Resources	27
<u>III. REFERENCES</u>	
A. Literature	29
B. Contacts	30
Figure 1: Soil Types in Gridley Area	8



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## I. INTRODUCTION

### A. Background and Purpose

In response to growing statewide concerns about the effects of urban development on valuable natural resources, legislation was adopted in 1970 to change the status of the Conservation Element from an optional section of local general plans to a mandatory element. Later legislation established a deadline of December 31, 1973 for adoption of Conservation Elements by cities and counties. These acts were legislative recognition of the fact that natural resources of regional and statewide significance can only be managed wisely by requiring local governments to use their delegated powers to manage development and land use.

As a small community dependent on agricultural activities for its economic base, Gridley is very concerned about maintaining the quantity and quality of natural resources necessary to support those activities. That concern was expressed in the joint Conservation - Open Space Element adopted by the City in 1974 and amended in 1980. This revision is intended to provide a more comprehensive analysis of natural resources to reflect the community's current thinking on resource issued, and to expand and refine the policy statements in other portions of the General Plan.

### B. Scope of Contents

According to Government Code Section 65302(d), the Conservation Element must consider:

"...the conservation, development and utilization of natural resources, including water and its hydraulic force, forests, soils, rivers and other waters, harbors, fisheries, wildlife, minerals and other natural resources."

According to State guidelines, a city's planning area should at least include its sphere-of-influence or "ultimate service boundary", plus any additional areas of planning concern. Since the City of Gridley is concerned about all nearby agriculture and resource-related activities which affect the community's economy and well-being, the Conservation Element addresses the use of natural resources in the entire market area or service area of the community. The use of resources located close to the City should reflect the proposals for urban growth in the Land Use Element, while resource policies in the outer portions of the area are regional issues which require close coordination with County planning efforts.

The time frame of the Conservation Element is determined by the fact that many natural resources can be consumed, removed, damaged or otherwise made unavailable for future use by unwise action today. In the Gridley area, this fact is particularly significant as it applies to the conversion of agricultural land to urban uses. Because this conversion is usually irreversible and permanently removes productive soils from agricultural use, the City's concerns extend into a far distant future but require immediate attention to prevent the needless removal of prime soil areas from agricultural use.

### C. Relationship to other Elements

The Conservation Element focuses on the management and use of economically productive natural resources. As such, it addresses much of the subject matter of both the Land Use and Open Space Elements. Since General Plans must be internally consistent, the Conservation Element has been developed to support and complement the policies stated in both of those elements.

The Land Use Element affects resource conservation policies in several ways. The projected amount and location of land needed for future urban growth indicates the areas to be removed from agricultural use, suggests the timing of such conversion, and shows the type of development which will replace or adjoin agricultural uses. The Land Use Element also contains general policies on urban development, rural uses and agricultural production which provide a starting point for policy analysis in the Conservation Element.

Although all resource-related land uses addressed in the Conservation Element are also required subjects of the Open Space Element, the law mandates different approaches for each Element. The Conservation Element focuses on the management of valuable physical materials while the Open Space Element must consider the preservation of all land areas devoted to the use of such resources.

## II. ANALYSIS AND POLICY FOR NATURAL RESOURCES

### A. Agricultural Soils

Description: The most important natural resources in and around the City of Gridley are the deep loam and clay soils which cover the entire area. Combined with the level terrain, warm climate and abundant water resources of the Sacramento Valley floor, these soil deposits support agricultural activities which provide most of Gridley's economic base. Viewed from a larger perspective, wise management of agricultural soils is essential because plant crops provide much of California's economic base and supply most of the world's food supply, either directly or as food for livestock. As the world's population increases and the problems of malnutrition and starvation receive more attention, it becomes more important than ever to manage our limited soil resources wisely.

The subsurface geology of the Gridley area consists of more than 5,000 feet of ocean-floor sediments overlain by several hundred feet of alluvial deposits from streams draining the Sierras, particularly during glacial periods. These deposits form an extremely variable mixture of loam, clay, silt and sand layers. According to the 1926 Soil Survey by the United States Department of Agriculture, there are more than 15 different surface soil types within five (5) miles of the City. The map attached as Figure 1 shows the distribution of soils in a large area around the City.

Although all Gridley area soils have a high nutrient level and little surface slope, their productivity varies widely because of differences in origin, age, texture, particle size and permeability of the surface layers and subsurface strata. The oldest surface soils in the area are the Gridley Clay Loam, Gridley Clay, Landlow Clay and Stockton Clay Adobe. The natural weathering processes and fine materials in these areas have created an impervious clay and mineral substrata which significantly limit root growth and subsurface drainage. The Gridley Clay Loam which covers at least half of the area shown in Figure 1, has an excellent surface texture, but the hardpan layer two (2) to four (4) feet below the surface limits its use to peaches, prunes, and crops other than nut trees. The fine texture and mineral accumulations of the Gridley, Landlow, and Stockton Clays further limit their use to rice, field crops and pasture.

The most productive soils in the Gridley area are the Honcut, Wyman and Columbia Loams, all of which lack distinctive hardpan layers, drain fairly well and are thus considered suitable for nearly all crops. Most of these areas are intensely cultivated with almonds, walnuts, fruit trees, and other valuable crops. The Wyman Loam is a fairly old terrace soil with heavier subsurface layers. The two (2) Honcut Loams are most recent deposits from small streams and floods and have a fairly unlayered profile. The Columbia Very Fine Sandy Loam consists of recent unstratified sediments from overflow of the Feather River found in a wide band along the River.

Although accepted methods of soil analysis and classification have changed greatly in the past 50 years, the 1926 survey is the only one in this area and the soil characteristics have not changed except for grading and other human activities. The survey report summarized the profile, texture, fertility, slope and other factors of each soil type, which affect crop production capabilities in a 0 to 100 rating called the Storie Index. The table below presents the Storie Index and selected characteristics for each soil type, including the United States Soil Conservation Service's current classification of general crop production capabilities.

<u>U.S.D.A. SOIL TYPE</u>	<u>GENERAL GROUP</u>	<u>HARDPAN LAYER</u>	<u>STORIE INDEX</u>	<u>CAPABILITY CLASS</u>
Columbia Very Fine Sandy Loam	Recent- alluvial	No	100	I
Gridley Clay Loam	Old- valley	Yes	68	II
Gridley Clay	Old- valley	Yes	42	III
Honcut Sandy Loam	Recent- alluvial	No	95	I
Honcut Loam	Recent- alluvial	No	100	I
Landlow Clay	Old- valley	Yes	18	IV
Stockton Clay Adobe	Old- valley	Yes	34	III
Wyman Loam	Old- valley	No	95	I

Section 51201 of the California Government Code defines "prime agricultural land" as areas with any of the following characteristics:

1. Storie Index rating of 80-100.
2. S.C.S. capability Class I and II.
3. Livestock carrying capacity of one animal unit per acre by U.S.D.A. criteria.
4. Planted with trees or vines normally returning at least \$200 per acre per year.
5. Annual return of at least \$200 per acre for three of the past five (5) years.

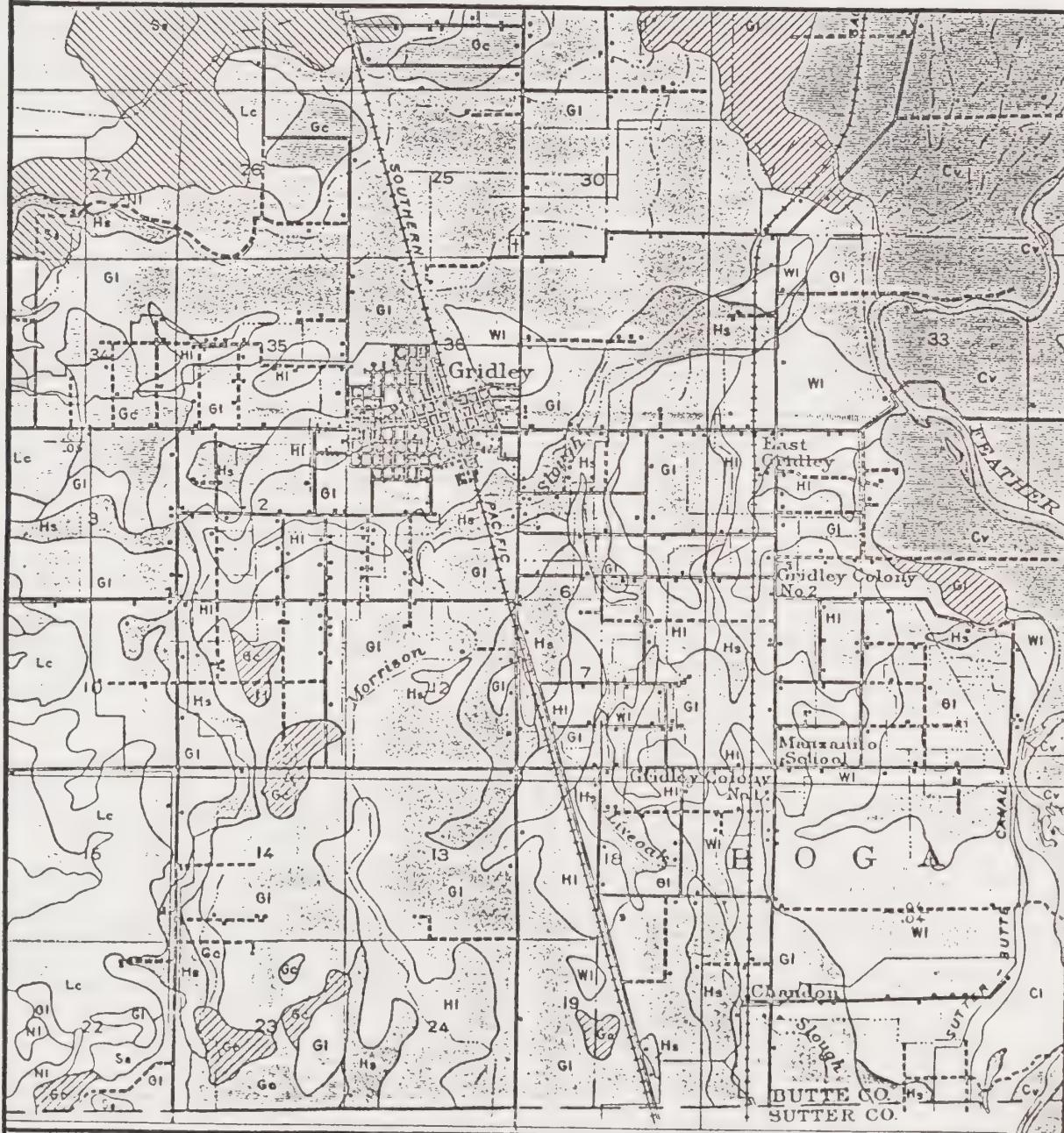
Because of excellent soil characteristics, nearly all of the Gridley area meets the first two (2) criteria. Although the Gridley Landlow and Stockton clays are not rated as high, they are both suitable for profitable rice production because of the hardpan layers and thus meet criteria #5. A statewide inventory of agricultural lands conducted by the Department of Water Resources in 1973 classified the entire Gridley area as prime agricultural land according to the California Government Code criteria.

Management: Because of the importance of prime soils and agricultural production to California's economy and culture, Article 28 of the California Constitution declares that it is in the best interests of the State to preserve lands used for the production of food and fiber and that assessment practices must reflect this objective. The Land Conservation Act of 1965, commonly called the Williamson Act, allows agricultural

# SOIL TYPES IN THE GRIDLEY AREA

CV	Columbia Very Fine Sandy Loam	HI	Honcut Loam
GI	Gridley Clay Loam	Lc	Landlow Clay
Gc	Gridley Clay	Sa	Stockton Clay Adobe
Hs	Honcut Sandy Loam	WI	Wyman Loam

From 1926 survey by the U.S. Department of Agriculture  
and University of California.



**FIGURE 1**  
**CONSERVATION ELEMENT**

Scale: 1" = 1 Mile



NORTH

landowners to contract with a County to maintain agricultural use of their land in exchange for property tax assessments based on contract restrictions and agricultural income rather than full market sales value. The State now pays the County \$1.00 per acre of prime agricultural land under contract and \$.40 per acre of non-prime land, but this reimbursement is usually less than the estimated tax loss to the County.

For some agricultural activities in some locations, the Williamson Act program can significantly reduce at least one cost of continuing those activities. However, it has been ineffective in providing tax breaks and helping agriculture in the Gridley area simply because few agriculturists have chosen to participate in this optional program. Because the productive value per acre of orchard crops is fairly high, property taxes under the income assessment method required by the Williamson Act are often no less than under the market value approach. The lack of economic incentive to property owners is often accompanied by the desire to keep open future options to profit from the development of their land. The county's 10-acre minimum for orchard crop contracts also prevents the inclusion of the many smaller parcels which might otherwise benefit from the program. The only new contracts in the Gridley area in recent years have been for rice lands several miles west of the City.

The City has long supported maximum agricultural use of the area's prime soils, but its ability to implement that policy is greatly limited by the legal powers of the State and County. Although the most obvious and effective preservation method is to

control the conversion of agricultural land to other uses, most such land is outside the City's limited boundaries and land use is therefore regulated by the County zoning and review processes addressed in the Open Space Element. Likewise, taxation, burning, pesticides, wages, working conditions, fuels, marketing, transportation and many other aspects of agricultural activities are regulated by State and County agencies which are beyond direct City control.

Consequently, City influence on agricultural production is usually indirect and limited to expressions of objectives and concerns to the appropriate agency through formal comment procedures or other coordinating mechanisms. The City should make sure that the overriding importance of agriculture to the community is considered by both local residents and public officials by distributing policy statements widely, and supporting educational and promotional programs related to agriculture.

The City's most direct power over the use of prime soils is the regulation of land use within City limits. Since it is the only entity providing domestic water and sewer service in the area and development on septic tanks and wells is limited to rural densities, the City controls urban development and growth to a high degree. Limiting growth to a reasonable rate and concentrating that development in a fairly compact area at urban densities will minimize the amount of prime soils covered over by future non-agricultural development. Areas within City limits

not needed for such development should be designated for agricultural uses and zoned accordingly. City zoning can also facilitate agriculture by allowing livestock and plant crops where compatible with adjacent uses and allowing food processing or other businesses which would facilitate agriculture in the area.

Another method commonly used by local governments to assist agricultural production is to sponsor or fund comprehensive soil surveys. The 1926 survey is useful only for general planning purposes and does not provide the variety, detail and usefulness of information that today's survey and analysis methods offer. Such information can help agriculturalists select crops and cultivation methods, estimate inputs and costs, predict crop yields, and maximize profit and income to the entire community. The substantial cost and uncertain funding have thwarted previous attempts to get a survey initiated in Butte County, but the City of Gridley's support might be effective in future efforts. Survey data could also help the design of roads, utilities and structures, as well as benefit many aspects of the planning process.

Further investigation should be conducted into the benefits and costs of forming a resource conservation district, an agency of the State which can provide a variety of resource conservation programs. Butte County is one of four (4) California counties which are not in such a district and thus cannot take advantage of the many information and counseling services provided by the district, the Soil Conservation Service and other cooperating

agencies. If the full range of services or involvement were not desired, a district could be set up solely to sponsor a new soil survey and would reduce the cost of that project.

The City might also be able to assist local agriculturalists by maximizing the effectiveness of the area's drainage system and minimizing their share of future improvement costs. Some area crops on soils with hardpan layers, particularly kiwifruit and peaches, have been severely damaged by standing water from the record rainfalls of the past two (2) years. Because of the soil conditions, level terrain and the limited capacity of existing drainage facilities, reducing this problem may not be easy, but any efforts in this direction certainly deserve City support. The City can more directly help agricultural drainage by ensuring that all new facilities and improvement costs required to adequately drain new development in the City will be provided by the developers and not by agricultural landowners in the district or drainage basin.

Goal: MAXIMIZE AGRICULTURAL USE AND PRODUCTION ON PRIME SOILS IN THE GRIDLEY AREA.

Policies and Actions:

1. Minimize the amount of prime soils used for future urban development.

    A. Designate sufficient land to accommodate a long-term annual growth rate comparable to the 1970-80 period.

    B. Allow maximum densities of urban development which are consistent with other City policies.

    C. Annex all areas designated for urban development.

D. Adopt zoning which meets urban growth needs for the next five (5) years and zone other lands for agricultural use.

2. Minimize costs of agricultural activities.

A. Encourage agricultural landowners to enter Land Conservation Act agreements where a reduction of taxes would result.

B. Support changes in the Land Conservation Act program which would increase the incentives for participation by landowners and the County.

C. Request full consideration of the needs of agriculture in the development and application of all regulations by State and County agencies.

D. Disseminate City policies on agriculture to all agencies or organizations involved with or affecting local farming operations.

E. Require developers to provide or fund all drainage facilities and improvements required by new development.

3. Maximize crop production.

A. Encourage development of industrial and commercial uses which serve or support crop production in the area.

B. Permit agricultural activities in all City zones with standards to ensure compatibility with other areas.

C. Encourage agriculturally-related research, education and promotional activities.

D. Support initiation of a comprehensive soil survey for all agricultural areas in Butte County.

E. Support County-level evaluation of the benefits and costs of forming a resource conservation district.

F. Support research and improvements to help improve the poor drainage conditions in some agricultural areas.

**B. Water Resources**

Because of the hot, rainless summers and uneven distribution of rainfall, the development of costly water storage and transportation facilities has been a necessary and critical factor in the growth of California. The entire Sacramento Valley is blessed with abundant water resources which have permitted maximum agricultural use of the prime soils and development of numerous urban centers such as Gridley.

The water needs of most of the domestic uses and a large proportion of agricultural uses in the Gridley area are met by wells. The largest quantities of ground water are used for rice and other irrigated crops. Water is usually found at ten (10) feet or less below the ground surface in most of the area, and ground water levels have dropped very little over time, even during the drought years of the late 1970's. The County Health Department now requires permits and logs for well drilling and usually requires that wells not take in water from the first few soil layers in order to avoid contamination from surface sources. Most wells in the area are less than 100 feet deep.

Public water systems supplied by wells serve the City of Gridley, the fairgrounds, two (2) mobile home parks, the Housing Authority complex on Oroville-Gridley Highway, and Manzanita School. The city currently has four (4) operating wells

connected to the system which produce 420 to 450 million gallons per year in recent years. The average daily consumption is 290 gallons per capita but this varies from 140 gallons per capita in the winter to a peak of 575 gallons per capita in the late summer.

The capacity of the city's system is generally adequate to handle present needs, but improvements will be needed to handle future growth. According to the engineer now serving the City system, improvements which will probably be needed in the future include upsizing of two (2) existing wells, adding new wells in areas of new development, and construction of a larger storage tank to maintain adequate flows and pressure for fire suppression.

There have been very few problems with minerals or contaminants in area wells. Evidence of significant levels of manganese from natural sources has been found in recent tests of a new City well, but evaluation of these results is not complete. The water system for the County Housing Authority complex is also being revised to eliminate manganese problems. The only other public well in the area which has shown quality problems in recent years was a subdivision well with evidence of bacteria from sewage; this problem was solved by annexing the subdivision to the City and hooking up to the City's water system. Although wells in some Central Valley communities have shown evidence of toxic chemicals from agricultural activities, periodic testing has found no such problems in the Gridley area.

Runoff from high precipitation levels in the northern Sierras is carried to the Gridley area by the Feather River and distributed to most of the agricultural lands by the Sutter-Butte Canal and its well-developed system of branches. The Canal's original headgate on the River was just above a dam six (6) miles north of the Oroville-Gridley Highway bridge, but the source was moved a half-mile west to the Thermalito Afterbay when the State Water Project was constructed in the 1960's.

Treated effluent from the City's sewer system has been transmitted to the Feather River for many years, but the method of treatment and location of discharge have undergone considerable change in order to meet all applicable standards. The present treatment plant on the east side of the River south of the Oroville-Gridley Highway has been in operation for four (4) years and receives sewage via a force main across the River from the old treatment plant on the east end of Richards Avenue. The old plant still has two (2) ponds used as back-up storage and disposal of septic tank residue. The pumping and design capacities of the treatment system should be adequate for substantial future growth. However, the need for future expansion of the treatment system can be reduced greatly by eliminating all identifiable sources of storm water infiltration.

As stated earlier, the quantity of available water resources in the Gridley area is more than adequate for present needs and should be adequate for future needs even if the State and urban areas to the south increase their removal and consumption of northern California water. However, the quality of both surface

and ground water can be damaged in many ways. Potential ground water contaminants include pesticides, industrial wastes, and sewage. The City should support all local and State regulations which would prevent such contamination. Similarly, the City should keep informed on all major water pollution problems in the Feather River which might affect agricultural users in the Gridley area.

Goal: MAINTAIN QUANTITY AND QUALITY OF WATER RESOURCES ADEQUATE FOR ALL USES IN THE GRIDLEY AREA.

Policies and Actions:

1. Oppose actions proposed by the State or other agencies which would limit the amount of surface or ground water available for use in the Gridley area.
2. Support strict enforcement of all County and State regulations on disposal of sewage and waste materials and the use of chemicals.
3. Maintain awareness of known quality problems in the Feather River and the area's ground water.
4. Maintain adequate capacity for planned future flows in the City's sewage collection and treatment system.
5. Expand the pumping and storage capacity of the City's water system to maintain adequate flows and pressure for fire suppression and all expected uses.

C. Vegetation and Wildlife

Description and Management: Most of the perennial grasses, oaks, riparian trees and other original vegetation of the Gridley area have been eliminated by agricultural and urban development. Narrow strips of natural vegetation and a variety of introduced

species adjoin many of the ditches, canals and sloughs in the area, particularly Live Oak and Morrison Sloughs. The largest cluster of mostly natural vegetation close to the City is a triangular area between the railroad and Township Road containing a large natural pond and numerous large trees. Heavily vegetated areas are valuable to the community because of the shade, oxygen, and visual relief they provide. There are no known areas of rare or endangered plant species in the Gridley area.

The lack of natural vegetation and permanent ground cover in cultivated areas limits the numbers and types of wildlife found in the Gridley area. Common mammals include squirrels, gophers, jackrabbits, skunks, mice, rats, opossum and raccoons. Both urban and agricultural areas provide nesting and feeding sites for numerous bird species, including sparrows, magpies, jays, robins, blackbirds, hummingbirds, hawks, owls, pheasant and quail. A variety of snakes, lizards, frogs, other reptiles and amphibians also inhabit the area. The only species reported in the area which is considered rare is Swainson's hawk which is found in natural grasslands, pasture, alfalfa, hay and grain crop areas.

Two (2) of the most important of natural vegetation and wildlife habitat in the Sacramento Valley are located within a few miles of Gridley. The Feather River and the adjacent woodlands within the flood control levees are of great importance to wildlife and have been classified as a natural resource of statewide significance and critical concern by the State Resources Agency. The River itself in this section is rated as a Class I-Premium fishery for salmon, steelhead, striped bass,

small-mouth bass, and shad. This resource not only provides food and recreational opportunities, but the travel and purchases related to sport fishing provide additional stimulus to the local economy. The State Department of Fish and Game is the delegated manager of this resource and has the power to regulate all activities within high water marks. Some of their present concerns include the lack of replenishment of gravel beds for spawning, gravel extraction adjacent to streams, unscreened pumps drawing off fish, and the effects of Oroville Hatchery releases on natural fry.

The riparian woodland along the River contains larger numbers of the many small species native to the Sacramento Valley and reportedly has some deer, fox, porcupine and other larger mammals rarely found in cultivated areas. Bald Eagles commonly winter in this habitat and peregrine falcons have also been reported in winter; both are classified as endangered species. The shade from streamside trees is also one factor in creating conditions conducive to bass in the River. Since most of this type of wildlife habitat in the state has been destroyed, it should be considered endangered.

Because of the predominance of irrigated rice fields and marshes, the entire southwest portion of Butte County west of Gridley is classified as an important wintering area for the Aleutian Goose and other migrating and native waterfowl. The most significant nearby areas in this regard are the ten-square-mile Gray Lodge Waterfowl Management Area operated by the State Department of Fish and Game and the Butte Sink area to the west. Seasonal waterfowl hunting brings in many visitors to the

community and provides important educational and recreational opportunities for many residents.

Goal: MAINTAIN NATURAL VEGETATION AND OTHER EXISTING CONDITIONS WHICH SUPPORT SIGNIFICANT WILDLIFE POPULATIONS.

Policies and Actions:

1. Limit site clearance and development of significant areas of natural vegetation adjacent to the Feather River and other bodies of water.
2. Support State regulation of activities along the Feather River which might damage spawning grounds, harm water quality or otherwise reduce fish populations.
3. Encourage County evaluation of ground projects to determine impacts on rare and endangered wildlife species and habitat.
4. Support continued operation of the Grey Lodge Waterfowl Management Area and other State activities which help maintain maximum waterfowl populations.

**D. Air Quality**

Description: Air is a natural resource which we often take for granted until it becomes polluted with odors or visible dust or smoke. Average air quality in the region around Gridley is fairly good because of the limited urban development and

extensive agricultural uses, and the clean air has been an important factor in attracting visitors and new residents to the northern Sacramento Valley. However, the relative high quality of air resources in the area is gradually decreasing because of that growth.

The modified Mediterranean climate in the area is characterized by hot dry summers and mild rainy winters. During the year the temperature may range from 20 to 115 degrees Farenheit with summer highs usually in the 90's and winter lows occasionally below freezing. Average annual rainfall is about 20 inches with snowfall being very rare. Prevailing winds are moderate in strength and vary from dry land flows from the north to moist ocean breezes from the south.

The mountains surrounding the Sacramento Valley create a barrier to air flow which can trap pollutants in the Valley when meteorological conditions are right. The highest frequency of air stagnation occurs in the autumn and early winter when large high-pressure cells lie over the Valley. The lack of surface wind during these periods and the reduced vertical flow caused by less surface heating reduces the influx of outside air and allows air pollutants to become concentrated in a stable volume of air. The surface concentrations of pollutants are highest when these conditions are combined with smoke from agricultural burning or when temperatures inversions trap cool air, fog and pollutants near the ground.

The primary sources of air pollution in this area are motor vehicles' internal combustion engines; pollutants carried by wind

from metropolitan areas to the south; the burning of rice stubble, orchard prunings and other agricultural wastes; burning fuel for space heatings, and various industrial and agricultural processes. The gases and particles produced by these sources can have serious negative affects on the health and growth of people, animals, natural vegetation and agricultural crops. Serious air pollution can also damage substances exposed to the air, block the view of distant mountains, interfere with many human activities, and generate economic and psychological costs which are not acceptable to most communities.

Management: Nearly all sources of air pollution can be controlled to acceptable levels through design techniques and emissions controls. Since air quality can only be effectively controlled on a regional or basin-wide level, regulation is handled by County, State and Federal Agencies. Standards setting limits on maximum levels for various harmful substances have been established by the State Air Resources Board (ARB) and the Federal Environmental Protection Agency (EPA). The Butte County Air pollution Control District (APCD) was formed in 1971 to enforce these standards and administer detailed regulations on emissions from stationary sources. New sources would require both an Authority to Construct and Permit to Operate from the District and might require EPA approval of a "Prevention of Significant Discharge" permit.

Pursuant to the Federal Clear Air Act of 1977, EPA designated Butte County as a non-attainment area because some monitoring data indicated that local concentrations of certain

pollutants exceeded national ambient air standards. A plan to achieve these standards and avoid restrictive controls was prepared and adopted by the Butte County Association of Governments in 1979, but no changes in the non-attainment designations were accepted until 1983. The current EPA position is that the County still does not meet standards for ozone and that the best available control technology must be used on new sources of hydrocarbons.

Although much of the authority to directly control emissions of pollutants belongs to high-level agencies, there is still much that the City can do to limit future reductions in air quality. Supporting strict enforcement of emissions standards and control measures is consistent with the City's desires to limit growth for other reasons and maintain a quality environment of residents. The City can also use its powers over land use to minimize future growth-related increased in vehicle emissions by confining development to a compact, contiguous area and limiting densities. Designing the local circulation system to maximize continuous vehicle movement and minimize the need for stopping and standing of vehicles with their engines running also limits total vehicle emissions.

**Goal:** MAINTAIN AIR QUALITY MEETING ACCEPTED STANDARDS FOR MAXIMUM CONCENTRATIONS OF POLLUTANTS.

1. Support Federal and State requirements for controlling emissions from vehicles, space heating, industry, agriculture and other sources.

2. Require new sources of harmful emissions to obtain all necessary permits and approvals.

3. Designate a future land use pattern for the community which minimizes total mileage required for vehicle trips.

4. Maintain relatively low densities overall and limit total growth in the urban area to insure adequate mixing and dilution of air pollutants.

5. Design local streets, traffic controls and parking areas to minimize stopping and standing.

6. Encourage public transit systems where feasible.

7. Encourage research into methods to reduce the need for agriculturally-related burning and spraying.

#### E. Sand and Gravel

Description: Although sand and gravel can be found in subsurface layers in much of the Gridley area, the only concentrated deposits of commercial importance are the alluvial deposits and mining tailings along the Feather River. Before the completion of Oroville Dam, these natural deposits were added to and moved by seasonal floodwaters, but the Dam and its control of downstream flows have ended this process. Relatively thin layers of silt, clay, wood debris and vegetation cover many of these streamside deposits. The size of gravel found decreases gradually as one moves downstream into the Gridley area.

The only natural deposit with commercially useful quantities of sand and gravel still remaining is east of the River south of the Oroville-Gridley Highway bridge. The site is essentially an abandoned river channel and has provided building materials for

over 30 years. Because of the limited materials remaining, however, extraction activities will probably cease in a few years. Other natural deposits along the River in the Gridley area do not have the size and accessibility to be commercially valuable.

Most future production of sand and gravel in the southern part of Butte County will take place in the extensive area of mining tailings along the Feather River south of Oroville. Those deposits were created by floating gold dredgers in the early part of this century and extend down the River to about two (2) miles north of the Oroville-Gridley Highway bridge. Most of the tailings are owned by the State of California and managed as the Oroville Wildlife Area. Because of the large size of the cobbles and gravel remaining, tailings are an excellent source of coarse aggregate, but it is difficult to obtain finer materials. A partially-dredged 40-acre site five (5) miles north of the Oroville-Gridley Highway bridge is owned by Mathews Readymix, Incorporated and will provide most of their materials needs in the foreseeable future.

Management: Since sand and gravel are used in the construction of buildings and roads and are very costly to transport, the Gridley community is fortunate to have such resources nearby. The City is not in a position to directly regulate the extraction process, but its support or interest could be helpful to such operations. Pursuant to the Surface Mining and Reclamation Act, County approval of a use permit and

reclamation plan would be required to initiate or expand such operations. Increased utilization of tailings now under State ownership is a future possibility, but concerns about impacts on fish, wildlife and water quality may restrict development of sand and gravel resources close to the River.

Goal: MAINTAIN MAXIMUM CAPACITY TO EXTRACT SAND AND GRAVEL FROM DEPOSITS AND TAILING NEAR THE FEATHER RIVER.

Policies and Actions:

1. Support proposals to develop or expand extraction sites to meet area needs for sand and gravel.
2. Encourage evaluation of State regulations or management policies which restrict extraction operations in areas with significant sand and gravel resources.

F. Natural Gas

Description: There are no known petroleum deposits in the Gridley area. However, there are several producing natural gas fields in the center of the Sacramento Valley west of Gridley. The nearest such field is the Wild Goose Field located about ten (10) miles west-southwest of the City between Butte Creek and the Grey Lodge Waterfowl area. The four (4) wells presently in operation are located in an area of about 360 acres and produced an estimated 45.7 billion cubic feet of gas in 1982.

The gas bearing deposit for this field is an oval dome of sand 2,500 to 3,500 feet below the surface. With current rates of production, the estimated total recoverable reserve would be consumed during the 1995-2000 time period. A geologist with the State Division of Oil and Gas has stated that exploratory

drilling in recent years has found some small new deposits, but that major new finds in the Sacramento Valley area are unlikely.

Management: The sales price for natural gas is now regulated by the Federal Energy Regulatory Commission and has been allowed to increase only as fast as the inflation rate of the economy. Because of this reason and other factors slowing demand, the consumption of natural gas is not expected to increase very rapidly in the future. The abundance of productive fields fairly close to urban market areas has kept prices in California relatively low. Since the urban core of Gridley is served by Pacific Gas and Electric's natural gas distribution system, it is to the community's advantage to do whatever it can to maintain maximum production capacity in Sacramento Valley fields.

Goal: ALLOW MAXIMUM DEVELOPMENT OF NATURAL GAS RESOURCES WEST OF THE CITY.

Policy and Actions:

Encourage continued exploration and research to expand known deposits of recoverable natural gas.

G. Energy Resources

The Gridley area has several natural resources currently used for generating heat and energy or which could be developed for such use in the future. The only non-renewable energy resources in the area are the natural gas deposits west of the City; their value and use were addressed in the preceding section.

Renewable energy resources found in the area include various types of wastes and plant materials which can produce methane gas or be burned directly, irrigation canals with enough flow and fall for hydroelectric generation, and, of course, the abundant direct sunlight characteristic of this climate. The supplies, development and management of these locally available renewable resources are addressed in the draft Energy Conservation Element being considered by the City, as well as the conservation of electricity and natural gas from sources outside the area. Adoption and implementation of the policies in that element and the policies on air quality and natural gas in this element adequately addresses the subject of energy resources, and no further City action is herein recommended.

### III. REFERENCES

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